

## **9. Marketing Grain Using a Storage Hedge**

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### **Abstract/Summary**

*Most farmers use on-farm grain storage as a convenience. If you have your own bins, you can get the crop out of the field quicker at harvest. You can take your grain to the elevator later when it isn't so busy, and you can easily use storage to defer income to the next year. Grain storage bins are not a positive marketing alternative in themselves. A storage hedge is a short hedge placed following harvest with grain being stored on the farm. The farmer is simultaneously long cash grain (grain in storage) hedged with a short futures position. By placing this hedge the farmer is attempting to take advantage of a strengthening basis where the appreciation of the basis is the return to storage.*



# ESTIMATING PROFITS FROM GRAIN STORAGE

2010 Risk and Profit Conference  
Manhattan, Kansas  
Presentation by Orlen Grunewald

## Reasons to Store Grain

- ▣ Using storage to speculate on a price rise
  - You are betting that the rise in price will be more than enough to pay your storage costs
  - You are betting that the odds favor a higher price more than a stable or lower price
  - Is it logical to make these assumptions?
    - It makes more sense to pre-harvest price your grain using futures and options

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## Reasons to Store Grain

- ▣ Using storage to earn a storage payment
  - The grain markets may be willing to pay for the time your commodities spend in your bin
  - The storage payment that the market offers each year is reflected in futures and cash prices
    - There are times the market is telling you it wants your crop now, and does not offer a storage payment
    - There are other times when the market tells you that later is better and offers a storage payment
  - Storage payments offer a more reliable (but not guaranteed) profit from holding a crop in storage

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## Calculating the Storage Payment

- ▣ You can calculate the storage payment that the market is offering in advance each year
- ▣ The three variables you need are:
  - Carrying charge is the amount of additional price included in futures contracts for later months
  - Basis is the difference between your local cash price and the nearby corn or soybean price
  - Carrying cost is the amount it will actually cost you to own and store your corn or soybeans from harvest until you sell and deliver them

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## Carrying Costs

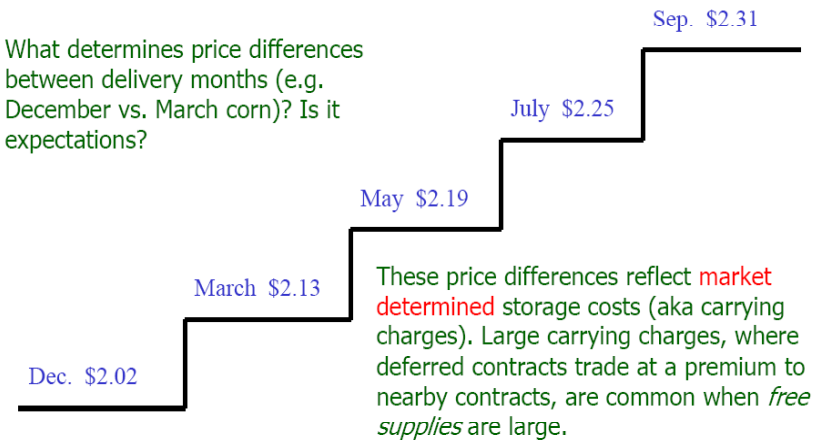
- ❑ Storage cost is the cost of keeping grain in storage including depreciation, maintenance, electricity, etc.
- ❑ Storage losses include shrinkage and spoilage
- ❑ Opportunity cost is the interest that you would have earned if you sold the grain and invested the funds in an interest-earning account
  - The opportunity cost would be higher if you have loans outstanding

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## Carrying Charge Market

October 26, 1999

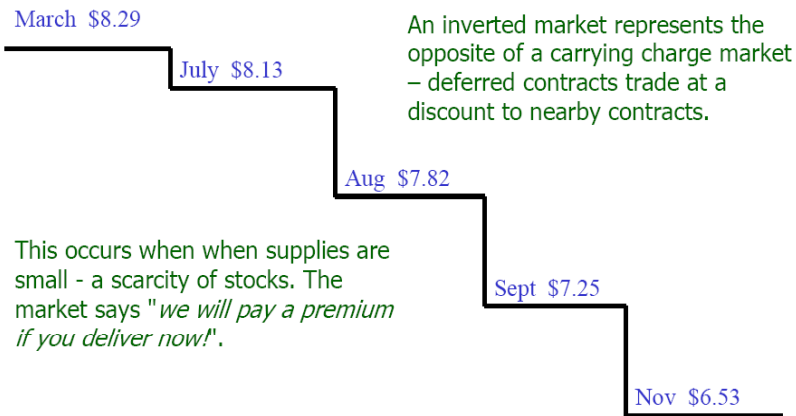
What determines price differences between delivery months (e.g. December vs. March corn)? Is it expectations?



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## Inverted Market

Feb 13, 2004

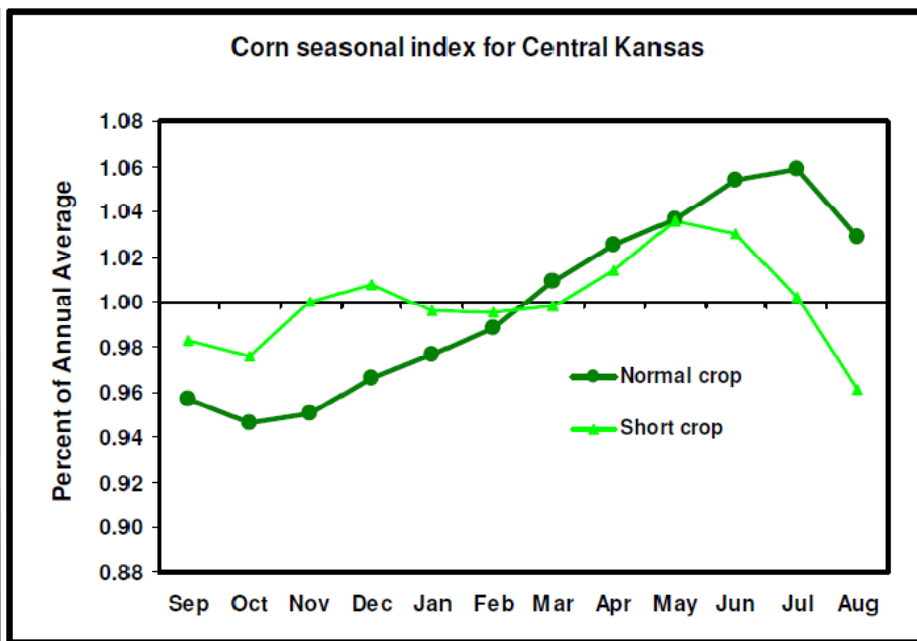


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## Carrying Charges and Selling the Carry

- ❑ A basic carrying charge rule of thumb is that large grain supplies = large carrying charges and low prices
  - Large carrying charges tells us that the market doesn't need grain today
- ❑ An inverted market means that your grain is wanted today and not in the future
- ❑ Generally, the best strategy is to do what the market wants us to do

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Source: Kevin Dhuyvetter, K-State

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## Price Patterns after Harvest

- On average, cash corn prices are lowest at harvest and rise in the spring
- Many producers believe corn futures prices have the same tendency, but the evidence is not there
- Corn futures price direction after harvest is a coin flip
  - July corn futures prices from Oct. 15 to May 15 have declined in 10 of the last 18 years
  - A strengthening basis is the primary driver behind rising prices in corn

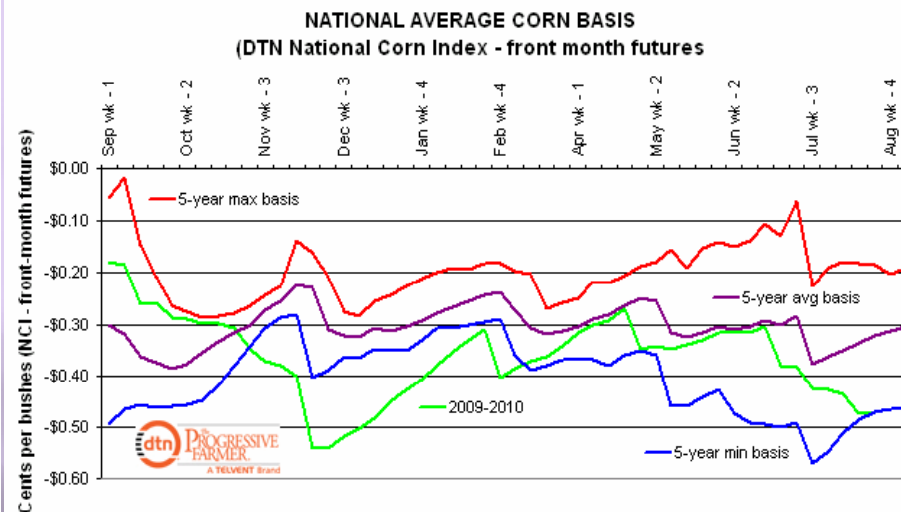
Source: "Grain Marketing is Simple" by Ed Usset

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## Corn Storage Example

- The farmer executes a storage by placing corn in storage at harvest and then short hedging the corn on the futures market
- The farmer will gain if the cash basis strengthens more than the cost of storage while eliminating the risk of prices declining

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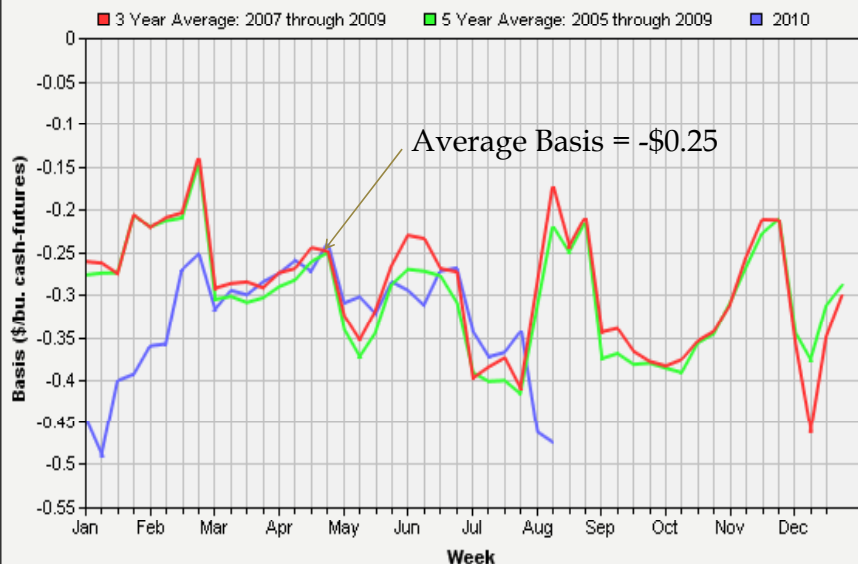


This chart shows the strongest (red line) and weakest (blue line) the national average corn basis (DTN National Corn Index - Chicago futures contract) has been over the last five marketing years along with the five year average basis (purple line). The national average basis (green line) was steady for the week yet pulled even with the 5-year minimum basis (blue line) while the futures market improved 7 cents. USDA cut carryout for 2010-11 by 61 million bushels on ideas that losses in world wheat production will result in stronger demand for corn.

- Bob Bailey, DTN Basis Analyst

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Basis Information: HANOVER, KS - Corn  
K-State Dept of Agricultural Economics, www.AgManager.info



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## Corn Storage Example

- Assumptions for Farmers Cooperative, Hanover, Kansas
  - Expected local cash price = \$3.68 per bu. forward contract bid
  - Expected basis at delivery in May = -\$0.25 or 25 cents under May corn futures
  - May2011 corn futures = \$4.48
  - On farm storage cost: \$0.01/bu./month
  - Opportunity cost on borrowed funds = 4%
  - Brokerage costs is \$50/round turn for a 5000 bu. contract

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## Step 1: Compute Carrying Charge

Item	Per Month	For 6 Months
Opportunity Cost	$4\%/12 = 0.0033\% \times \$3.68 = \$0.012$	$0.012 \times 6 = \$0.07$
+ On Farm Storage Cost	\$0.01	$\$0.01 \times 6 = \underline{\$0.06}$
= Total Carrying Cost (11/1 to 5/1)		\$0.13

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## Step 2: Compute Expected Net Sale Price

Item	\$/bu.
May 2011 Corn Futures Price Today	\$4.48
- Expected Hanover Basis at Delivery on 5/1/2011	- \$0.25
- Brokerage Commission	- <u>\$0.01</u>
= Expected Net Sale Price on 5/1/2011	= \$4.22

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## Step 3: Calculate Expected Net Return to Storage of Corn

Item	\$/bu.
Expected Net Sale Price on 5/1/2011	\$4.22
- Cash Price on 11/1/2010	- \$3.68
- Total Carrying Charge (11/1 to 5/1)	- <u>\$0.13</u>
= Expected Net Return to Storage	= \$0.41

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## Storage Hedge Results if Prices Fall

Cash Corn	Corn Futures	Basis
Date: Today Place 5000 bu. corn in storage at harvest with an expected cash price = \$3.68	Establish Futures Position Sell 1 May 2011 Corn Futures Contract = \$4.48	-\$0.80 = \$3.68 - \$4.48 11/1/2010 basis for May 2011 Corn Contract
Date: 5/1/2011 Sell Cash Corn out of storage at cash price = <u>\$3.50</u>	Offset Futures Position Buy 1 May 2011 Corn Futures Contract = <u>\$3.75</u>	-\$0.25 = \$3.50 - \$3.75 5/1/2011 basis for May 2011 Corn Contract
Loss on cash price = -\$0.18	Gain on futures = +\$0.73	+\$0.55 gain on basis
Results on 5/1/2011:		
Cash price received = \$3.50		
Gain on futures = +\$0.73		
Futures commission = <u>-\$0.01</u>		
Net sale price = \$4.22		
Carrying charge = <u>-\$0.13</u>		
Net Price = \$4.09		

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## Storage Hedge Results if Prices Rise

Cash Corn	Corn Futures	Basis
Date: Today Place 5000 bu. corn in storage at harvest with an expected cash price = \$3.68	Establish Futures Position Sell 1 May 2011 Corn Futures Contract = \$4.48	-\$0.80 = \$3.68 - \$4.48 11/1/2010 basis for May 2011 Corn Contract
Date: 5/1/2011 Sell Cash Corn out of storage at cash price = <u>\$5.00</u>	Offset Futures Position Buy 1 May 2011 Corn Futures Contract = <u>\$5.25</u>	-\$0.25 = \$3.50 - \$3.75 5/1/2011 basis for May 2011 Corn Contract
Gain on cash price = +\$1.32	Loss on futures = -\$0.77	+\$0.55 gain on basis
Results on 5/1/2011:		
Cash price received = \$5.00		
Loss on futures = - \$0.77		
Futures commission = <u>-\$0.01</u>		
Net sale price = \$4.22		
Carrying charge = <u>-\$0.13</u>		
Net Price = \$4.09		

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## Net Return to Storage using Basis Change

Item	\$/Bu.
Basis change	\$0.55
- Total carrying charge	- \$0.13
- Brokerage commission	- <u>\$0.01</u>
= Net return to storage	= \$0.41

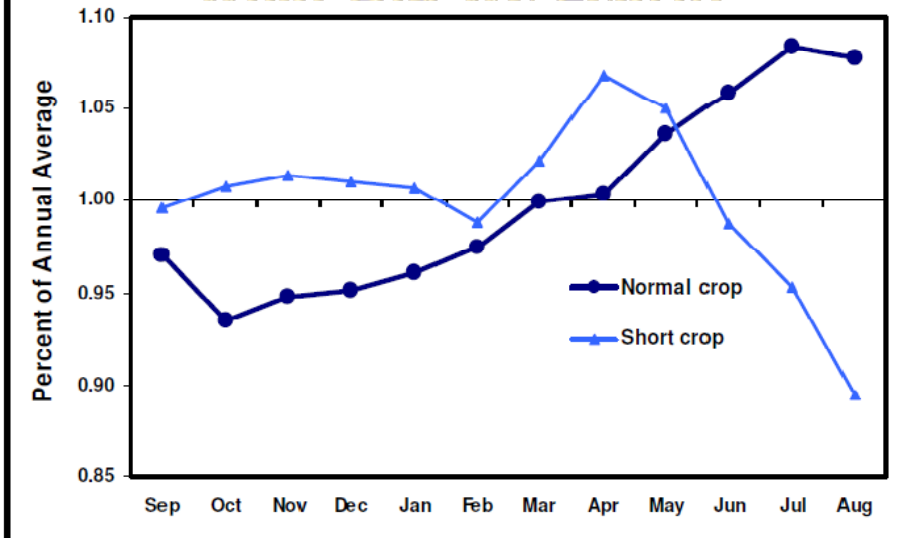
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## Sell The Carry

- ▣ The above pricing example offers a good return
- ▣ This return may seem to low but consider
  - It is a premium over the current forward contract price at harvest
  - You can delay sales until next year for tax purposes
  - It will take away downside risk
- ▣ The disadvantages are
  - The strategy takes away any upside potential if the market rallies
  - The basis may not strengthen as much as projected

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Soybean seasonal index for Central Kansas



Source: Kevin Dhuyvetter, K-State

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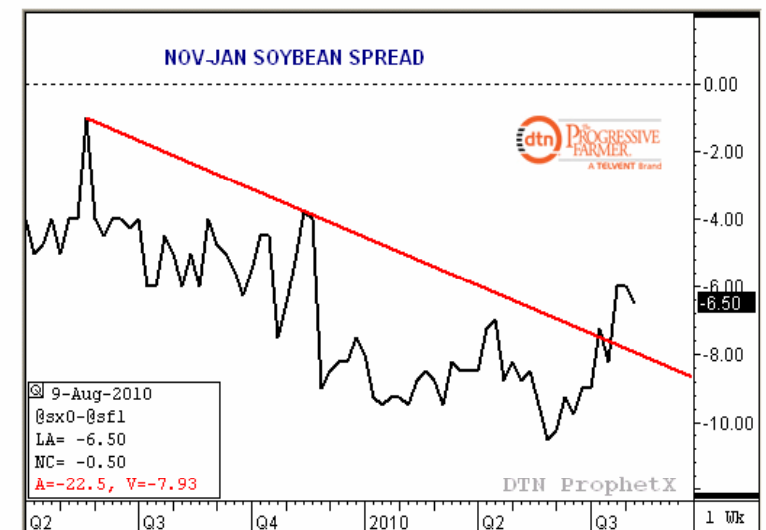
## Price Patterns after Harvest

- ▣ On average, cash soybean prices are lowest at harvest and rise in the spring
- ▣ Soybean futures price direction after harvest is more favorable
  - July soybean futures prices from Oct. 15 to May 15 have increased in 13 of the last 18 years (70% of the time)
  - The soybean storage hedge is a little more questionable

Source: "Grain Marketing is Simple" by Ed Usset

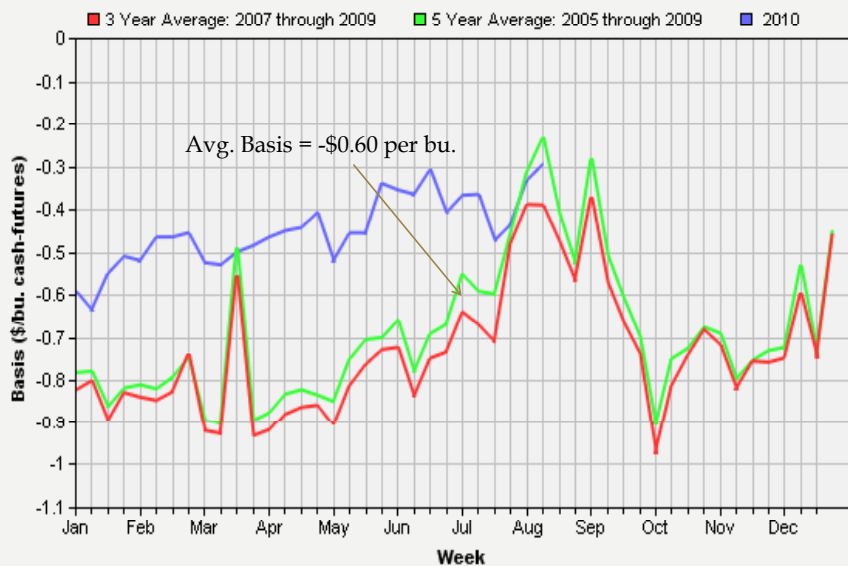
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**SPREAD:** The carry in the November-to-January futures spread indicates a neutral commercial outlook.



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**Basis Information: HANOVER, KS - Soybeans**  
 K-State Dept of Agricultural Economics, www.AgManager.info



## Soybean Storage Example

- Assumptions for Farmers Cooperative, Hanover, Kansas on November 1, 2010
  - Expected local cash price = \$9.42 per bu. forward contract bid
  - Expected basis at delivery in July = -\$0.60 or 60 cents under July soybean futures
  - July 2011 soybean futures = \$10.45
  - On farm storage cost: \$0.01/bu./month
  - Opportunity cost on borrowed funds = 4%
  - Brokerage costs is \$50/round turn for a 5000 bu. contract

## Step 1: Compute Carrying Charge

Item	Per Month	For 8 Months
Opportunity Cost	$4\%/12 = 0.0033\% \times \$9.42 = \$0.031$	$0.031 \times 8 = \$0.25$
+ On Farm Storage Cost	\$0.01	$\$0.01 \times 8 = \underline{\$0.08}$
= Total Carrying Cost (11/1 to 7/1)		\$0.33

## Step 2: Compute Expected Net Sale Price

Item	\$/bu.
July 2011 Soybean Futures Price Today	\$10.45
- Expected Hanover Basis at Delivery on 7/1/2011	- \$ 0.60
- Brokerage Commission	- <u>\$ 0.01</u>
= Expected Net Sale Price on 7/1/2011	= \$ 9.84

## Step 3: Calculate Expected Net Return to Storage of Corn

Item	\$/bu.
Expected Net Sale Price on 7/1/2011	\$9.84
- Cash Price on 11/1/2010	- \$9.42
- Total Carrying Charge (11/1 to 7/1)	- \$0.33
= Expected Net Return to Storage	= \$0.09

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## Sell The Carry?

- The soybean strategy is shaping up to be a wash
  - Current “implied basis” on the forward contract is -\$0.70 per bu.
  - This basis is exactly equal to the 3 and 5 year basis average for Hanover, Kansas on November 1
  - The soybean futures market spread between contract months is neutral

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## Summary

- Quick method to find the answer
  - Delivery month futures price
  - - (+) Expected basis at delivery
  - - Storage cost per bushel
  - - Futures commission per bushel
  - = Net hedge price
- Compare the results with harvest time cash price or forward contract offers
- Formula:
  - Net hedge price - harvest time price = storage hedge gain
  - If the result is higher than cash price the storage hedge will pay

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